

ABSTRACT

A process for etching multiple layers on a substrate **25** in an etching chamber **30** and cleaning a multilayer etchant residue formed on the surfaces of the walls **45** and components of the etching chamber **30**. In multiple etching steps, process gas comprising different compositions of etchant gas is used to etch layers on the substrate **25** thereby depositing a compositionally variant etchant residue inside the chamber **30**. In one cleaning step, a first cleaning gas is added to the process gas to clean a first residue or to suppress deposition of the first residue onto the chamber surfaces. In a second cleaning step, another residue composition is cleaned off the chamber surfaces using a second cleaning gas composition.